TEMPERATURE/HUMIDITY TRANSMITTER - WALL (4-20 MA)
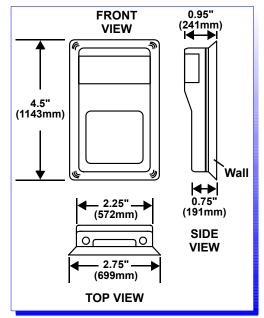
Description

The THW420 combination temperature/humidity transmitter is designed to meet applications that require local indication of both temperature and humidity in a single, aesthetically pleasing enclosure.

This device incorporates a 10K ohm (Ω) platinum RTD. The transmitter requires 24 VDC. The sensor provides an accurate and predictable four-wire, 4-20 mA output signal for temperature and a second 4-20 mA output signal for humidity.

Dimensions

FRONT VIEW
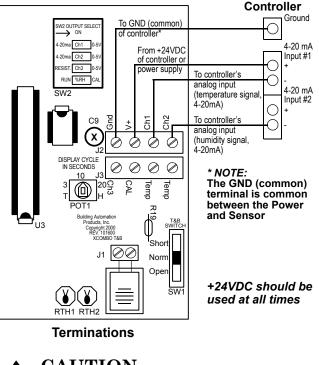**SIDE VIEW**
TOP VIEW

0.95" (241mm)
4.5" (1143mm)
2.25" (572mm)
0.75" (191mm)
2.75" (699mm)
Wall

Specifications

Output	4 to 20 mA
Sensor	10K Ω platinum RTD
Supply Voltage	24 VDC
Tolerance of Resistance (Accuracy)	±1.5°F (±0.83°C) ±2% RH (from 15 to 95% RH)
Response Time	20 seconds for a 63% step
Environmental Operating Range (Transmitter)	45°F to 96°F; 0 to 100% RH (7°C to 35°C); 0 to 100% RH

Termination

The THW420 transmitter must be powered from a 24 VDC supply. The combination temperature/humidity sensor is terminated as follows:

· The **humidity transmitter** requires a three-wire termination for the 4-20mA output using 24 VDC.
· The **temperature sensor** also requires a three-wire termination. In most cases, it obtains power from the analog input to which it is connected and no external power is required.

Though interference from external sources is not a major problem with current transmitters, Liebert recommends separating the wiring from line voltage wiring and from wiring used to supply highly inductive loads such as motors, generators and coils. Liebert also recommends making power connections with twisted pair wire of at least 22 AWG and crimp-type connectors.
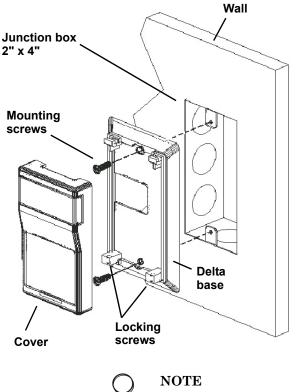

Terminations

* NOTE: The GND (common) terminal is common between the Power and Sensor

+24VDC should be used at all times

⚠ CAUTION

Liebert recommends wiring the sensor WITHOUT power applied because accidental arcing may damage the product and will void the warranty.

Ordering Information

Quantity	Part #	Description
	THW420	Combination Temperature/Humidity Transmitter Wall 4-20 mA @ 45°F to 96°F and 0 to 100% RH

Mounting

Wall

Junction box 2" x 4"

Mounting screws

Cover

Locking screws

Delta base

Enclosure Mounting Instructions

Mounting hardware is provided for both junction box and drywall installation.

1. Pull the wires through the opening in the base plate.
2. **For junction box installation:** Secure the base to the box using the #6-32 x 1/2" mounting screws provided.

    For drywall installation: Drill two 3/16" holes 3-1/4" apart on center. Insert the drywall anchors and secure the base using the #6 x 1" sheet metal screws provided.
3. Terminate the unit according to the guidelines in **Termination on page 1**.
4. Attach the cover by latching it to the top of the base, rotating the cover down and snapping it into place.
5. Secure the cover by backing out the lock-down screws using a 1/16" allen wrench until they are flush with the bottom of the cover.

NOTE

In a wall-mount application, the wall temperature and the temperature of the air within the wall cavity can cause erroneous readings. The mixing of room air and air from within the wall cavity can lead to condensation and premature failure of the sensor.

To prevent these conditions, seal the conduit leading to the junction box and seal the hole in the drywall by using an adhesive backed, foam insulating pad.

Troubleshooting Guide

The following table lists common problems and possible solutions. For more information, consult your local dealer, Liebert representative or the Liebert Worldwide Support Group.

Problems	Possible Solutions
Unit will not operate	• Check +24 VDC power supply at controller. • Disconnect the sensor and check power wires for +24 VDC.
Humidity reading is maximum 20 mA or 100%	• Make sure the sensor is installed properly, and is not shorted. • **Quick Check:** Remove the sensor. If the reading does not change, contact technical support.
Humidity reading is minimum 4 mA or 0%	• Verify that the humidity sensor installed. • **Quick Check:** Short the sensor terminal block with a wire. Does the reading change? If so, the sensor may be faulty; if not, contact technical support.
Humidity reading in software appears to be off more than specified accuracy	• Check all software parameters. • If available, check the sensor against a calibrated control such as a hygrometer. • Determine if the sensor is exposed to an external source more than room.
Temperature sensor in front-end software is reading high	• Make sure wiring is correct. • Disconnect wires and measure with a multimeter.
Temperature sensor in front-end software is reading low	• Make sure wiring is correct. • Disconnect wires and measure with a multimeter.

Troubleshooting - Humidity Signal Verification

4 to 20 mA Signal

You will measure the humidity output by placing an ammeter in series with the controller input. The controller input is connected to the terminal marked "Ch1 or Ch2" on the humidity board.

1. Verify the unit is terminated properly using **Figure 2** shown below, and set your meter to the "Volts" setting.
2. Verify you have 24 VDC supplied to the unit by measuring between the "V+" and "GND" terminals at the sensor, as shown below in **Figure 1**.
3. Set your meter to "Amps" and measure the output between "Ch1 or Ch2" and the controller input as shown below in **Figure 1**.
4. Use the following formula to determine what humidity the sensor is reading:

   (mA - 4) / 0.16 = %RH

   where **mA** is the current reading from the ammeter (in mA)

> *Example:*
> If the current reading is 16 mA, then:
> $$\%RH = (16 - 4) / 0.16$$
> $$= 12 / 0.16$$
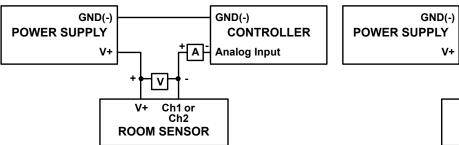> $$= \mathbf{75\%}$$

Figure 1 Supply Voltage and 4-20mA Verification

Figure 2 4 to 20 mA Output Connection